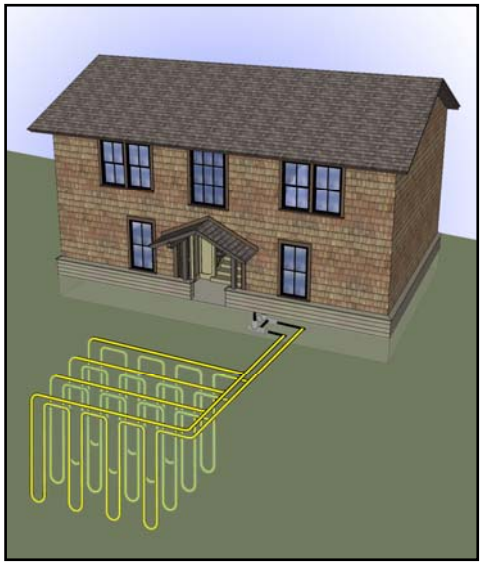
Yosemite National Park

National Park Service
U.S. Department of the Interior

The Greening of Employee Housing: Ground Source Heat Pump System



The glycol fluid flows through the loops in the geo-field.

The finished Curry Village employee housing.

How does a ground source heat pump (GSHP) work?

The new Curry Village employee housing area incorporates an environmentally friendly and highly efficient heating and cooling system called a ground source heat pump (GSHP). The system utilizes the near constant temperature of the earth to keep the buildings heated and/or cooled. A glycol and water mixture is pumped through a "geo- field", which consists of a network of plastic pipes installed vertically in deep bore holes in the ground. At Curry Village, this geo- field is comprised 178 bore holes, each 280' deep, all tied together in a loop configuration.

The glycol fluid exchanges heat between the buildings and the earth by means of electrically- powered heat pumps located inside the residential buildings.

In winter, warmth is drawn from the earth and exchanged with the buildings. In the summer, the process is reversed; heat is extracted from air inside the buildings and transferred to the ground by means of the glycol fluid that flows through the loops in the geo- field.

Electrically-powered heating and cooling pumps

How does a GSHP system compare to other air-conditioning systems?

The Environmental Protection Agency (EPA) has found that GSHP systems are the most energy- efficient, environmentally clean, and cost- effective space- conditioning systems available. The EPA also found that these heat pump systems offer the lowest carbon dioxide emissions and lowest overall environmental cost of all the residential space- conditioning technologies readily available today. The few emissions that are released occur at power plants, where they can be more carefully monitored and controlled.

What are some of the benefits of this technology?

There are many advantages to using this ground source heat pump system as opposed to other alternatives. Some of them are:

- Very low heating and cooling costs—approximately 40% less than the next best technology
- Excellent comfort and humidity control
- Quiet operation minimizes noise pollution
- No air pollution added to the park
- No need to purchase, transport or use propane
- No mechanical equipment is located outdoors which enhances visual aesthetics